

WHAT IS CLAIMED IS:

1. An integrated coil supporting unit for an engine including an engine block, the integrated coil supporting unit comprising:

a casing having an elongated shape;

a plurality of coil units, each of which includes;

an ignition coil; and

a coil support portion, which is integrated with the ignition coil and supports the ignition coil inside the casing,

wherein the coil support portions are disposed inside the casing at predetermined intervals, and each ignition coil extends from the corresponding coil support portion toward an outside of the casing;

a plurality of slide admissive means, each of which is provided for the corresponding coil unit to allow the coil unit to slide in all directions on a two-dimensional plane along which casing extends; and

a plurality of fastening members, each of which positionally fixes the corresponding coil unit at a predetermined position in the casing and simultaneously fastens the corresponding coil unit and the casing to the engine.

2. The integrated coil supporting unit as in claim 1, wherein:

each slide admissive means includes a projecting portion, which projects from the casing into an inside of the casing,

and a fastening portion, which is formed in the coil support portion and has a through hole penetrating through the fastening portion; and

the projecting portion is disposed in the through hole with a clearance therebetween, thereby to allow the coil unit to slide on the two-dimensional plane along which the casing extends.

3. The integrated coil supporting unit as in claim 2, wherein:

the casing includes a first wall, a second wall and a pair of side walls facing each other, the first wall and the second wall facing each other;

each slide admissible means further includes an another projecting portion, which projects from the casing;

the projecting portion is formed on the first wall, and the another projecting portion is formed on the second wall; and

the another projecting portion is disposed in the through hole with a clearance therebetween so as to allow the coil unit to slide.

4. The integrated coil supporting unit as in claim 2, wherein:

the casing includes a wall and a pair of side walls facing each other; and

the projecting portion corresponding to each coil unit

is formed on the wall.

5. The integrated coil supporting unit as in claim 3, wherein:

the projecting portion on the first wall has a first through hole penetrating therethrough;

the projecting portion on the second wall has a second through hole penetrating therethrough; and

the fastening member is engaged with the engine block through the first through hole and the second through hole.

6. The integrated coil supporting unit as in claim 5, wherein the casing has a plurality of detachment stopper means, each of which prevents the corresponding fastening member from detaching from the casing.

7. The integrated coil supporting unit as in claim 4, wherein the wall has a plurality of detachment stopper means, each of which prevents the corresponding fastening member from detaching from the casing.

8. The integrated coil supporting unit as in claim 1, wherein:

each coil unit has a first connector;

the casing has a plurality of second connectors, each of which is to be electrically connected with the first connector;

a clearance is provided between each first connector and

the corresponding second connector when being connected, thereby to allow the corresponding coil unit to slide.

9. An integrated coil supporting unit for an engine including a plurality of plug holes on an engine block, the integrated coil supporting unit comprising:

a plurality of ignition units including a plurality of integrated ignition coils and spark plugs for installation in the plug holes, respectively;

a casing having an elongated shape for attachment to the engine block to cover the plug holes; and

a plurality of fastening members engaged with the casing and the ignition units, respectively, for holding the casing and the ignition units integrally and fastening the casing to the engine block together with the ignition units,

wherein each of the ignition units has an extension part extending radially outward from a corresponding ignition coil so that the fastening members are engaged with the engine block at locations radially outside the plug holes, respectively, and

wherein the extension part has a through-hole that is larger in diameter than a corresponding fastening member thereby to allow the corresponding ignition unit to move in a radial direction of a corresponding fastening member.

10. The integrated coil supporting unit as in claim 9, wherein:

the casing is box-shaped and has a pair of projections

for each extension part to sandwich the extension part in the casing and engage with the corresponding fastening member.